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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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7590	08/10/2005			
Robert K. Fergan BRINKS HOFER GILSON & LIONE P.O. Box 10395 Chicago, IL 60610			EXAMINER MCCLOUD, RENATA D	
			ART UNIT 2837	PAPER NUMBER

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/821,684	Applicant(s) ANWAR ET AL.	
	Examiner Renata McCloud	Art Unit 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 28-29 are objected to because of the following informalities:

Claims 28 and 29 recite the limitation "the third and fourth power switch". There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-9,22-27 are rejected under 35 U.S.C. 102(b) as being anticipated by French et al (US 6051942).

Claims 1 and 22: A system comprising a SRM including a plurality of phases, each phase including a plurality of machine coils (Figs.1-2); a plurality of positive side switch circuits (Fig. 3A: 35a,b, c) in electrical parallel connection, wherein each positive side switch circuit is electrically connected to a positive side of a machine coil (col 8:52-55) of the plurality of machine coils and configured to control the flow of current through the machine coil; and a plurality of negative side switch circuits (36a,b,c) in electrical parallel connection, wherein each negative side switch circuit is electrically connected to a negative side of a machine coil (col 8:52-55) of the plurality of machine coils and configured to control the flow of current through the machine coil.

Claim 2: each positive side switch circuit includes a first power switch (35a) and a first diode (38a), and each negative side switch circuit includes a second power switch (36a) and a second diode (diode above 36a).

Claim 3: the positive side of the machine coil between the first power switch (35a) and the first diode (38a).

Claim 4: the negative side of the machine coil between the second power switch (36a) and the second diode (diode above 36a).

Claims 5, 23: the first and second power switches are MOSFETS (Col. 9:5-7).

Claims 6, 24: the first and second power switches are N-channel MOSFETS (Col. 9:5-7).

Claims 7, 25: a source of the first power switch (35a) is in electrical communication with a cathode of the first diode (38a) and a drain of the second power switch (36a) is in communication with an anode of the second diode (diode above 36a).

Claims 8, 26: a power source (Fig. 3a:Vcc), wherein a first side of the power source is in electrical communication with a drain of the first power switch (35a) and cathode of the second diode (diode above 36a) and a second side of the power source is in electrical communication with an anode of the first diode (38a) and a source of the second power switch (36a).

Claims 9, 27: a first capacitor (34) in electrical parallel connection with the first power switch (35a) and the first diode (38a) between a drain of the first power (35a) switch and an anode of the first diode (38a).

4. Claims 1-4, 22, 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Jones et al (US 5708576)

Claims 1 and 22: A system comprising a SRM including a plurality of phases, each phase including a plurality of machine coils (Fig 2); a plurality of positive side switch circuits (Fig. 3: S1a-n) in electrical parallel connection, wherein each positive side switch circuit is electrically connected to a positive side of a machine coil (WA) of the plurality of machine coils and configured to control the flow of current through the machine coil; and a plurality of negative side switch circuits (S2A-n) in electrical parallel connection, wherein each negative side switch circuit is electrically connected to a negative side of a machine coil (WA) of the plurality of machine coils and configured to control the flow of current through the machine coil.

Claim 2: each positive side switch circuit includes a first power switch (S1A) and a first diode (D2A), and each negative side switch circuit includes a second power switch (S2A) and a second diode (D1A).

Claim 3: the positive side of the machine coil between the first power switch (S1A) and the first diode (D2A).

Claim 4: the negative side of the machine coil between the second power switch (S2A) and the second diode (D1A).

Claim 27: a first capacitor (C1A) in electrical parallel connection with the first power switch (S1A) and the second switch (S2A) between a drain of the first power (S1A) switch and a source of the second switch (S2A).

Claim 28: a second capacitor (C1n) in electrical parallel connection with a third and fourth power switch (S1n, S2n) between a drain of the third power (S1n) switch and a source of the second switch (S2n).

Claim 29: the first capacitor (C1A) is mounted in close proximity to the first and second power switches (S1A, S2A) and the second capacitor (C1n) is mounted in close proximity to third and fourth second power switches (S1n, S2n), wherein the first and second capacitors are

configured to provide DC transients line filtering and snubbing of switch off transients (col. 3:16-20).

5. Claims 1,12, 19,22 are rejected under 35 U.S.C. 102(b) as being anticipated by Tang et al (US 6078122)

Claims 1, 22: A system comprising a SRM including a plurality of phases, each phase including a plurality of machine coils (Figs 1-2); a plurality of positive side switch circuits in electrical parallel connection, wherein each positive side switch circuit is electrically connected to a positive side of a machine coil of the plurality of machine coils and configured to control the flow of current through the machine coil; and a plurality of negative side switch circuits in electrical parallel connection, wherein each negative side switch circuit is electrically connected to a negative side of a machine coil of the plurality of machine coils and configured to control the flow of current through the machine coil (Fig. 9; col. 10:8-25).

Claim 12: each positive side switch circuit includes a first and second power switch in electrical series connection and each in negative side switch circuit includes a third and fourth power switch in electrical series connection (Fig. 9; col. 10:8-25).

Claim 19: a first capacitor (92) in electrical parallel connection with the first power switch and the second switch between a drain of the first power switch and a source of the second switch (Fig. 9: switches to the left of B).

6. Claims 1,12- 15,22 are rejected under 35 U.S.C. 102(b) as being anticipated by Lewis (US 6307345)

Claims 1,22: A system comprising a SRM including a plurality of phases, each phase including a plurality of machine coils (Fig 2); a plurality of positive side switch circuits in

electrical parallel connection (fig. 1:2a/6a, 5a/7a), wherein each positive side switch circuit is electrically connected to a positive side of a machine coil (3,6) and configured to control the flow of current through the machine coil; and a plurality of negative side switch circuits (6b/2b, 7b/5b) in electrical parallel connection, wherein each negative side switch circuit is electrically connected to a negative side of a machine coil of the plurality of machine coils and configured to control the flow of current through the machine coil.

Claim 12: each positive side switch circuit includes a first (2a) and second (6a) power switch in electrical series connection and each in negative side switch circuit includes a third (6b) and fourth (2b) power switch in electrical series connection.

Claim 13: a positive side of the machine coil (3) is connected between the first and second power switch (2a, 6a)

Claim 14: a negative side of the coil (3) is connected between the third and fourth power switch (6b, 2b)

Claim 15: the first, second, third, and fourth power switches are MOSFET'S (Fig. 4).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 5,6, 9-11, 23²⁴, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al in view of French et al.

Claims 5, 23: Jones et al teach the limitations of claims 2 and 22. Referring to claims 5 and 23 they do not teach the first and second power switches are MOSFET'S. French et al teach the first and second power switches are MOSFET'S. (Col. 9:5-7). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Jones et al to use MOSFET's as taught by French et al for fast power switching.

Claims 6, 24: Jones et al and French et al teach the limitations of claims 5 and 23. Referring to claims 6 and 24, French et al teach the first and second power switches are N-channel MOSFETS (Col. 9:5-7).

Claim 9: Jones et al and French et al teach the limitations of claim 5. Referring to claim 9, Jones et al teach a first capacitor (C1A) in electrical parallel connection with the first power switch (S1A) and the first diode (D2A) between a drain of the first power (S1A) switch and an anode of the first diode (D2A).

Claim 10: Jones et al and French et al teach the limitations of claim 9. Referring to claim 10, Jones et al teach a second capacitor (C1n) in electrical parallel connection with a second power switch (S2A) between a source of the second power switch (D1A) and a cathode of the second diode (S2A).

Claim 11: Jones et al and French et al teach the limitations of claim 10. Referring to claim 11, Jones et al teach the first capacitor (C1A) is mounted in close proximity to the first power switch (S1A) and the second capacitor (C1n) is mounted in close proximity to the second power switch (S2A), wherein the first and second capacitors are configured to provide DC transients line filtering and snubbing of switch off transients (col. 3:16-20).

9. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis in view of French

Claim 16: Lewis teaches the limitations of claim 15. Referring to claim 16, Lewis does not teach the power switches are N-channel MOSFETS. Jones et al teach French et al teach the first and second power switches are N-channel MOSFETS (Col. 9:5-7). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Jones et al to use MOSFETs as taught by French et al for fast power switching.

Claim 17: Lewis and French et al teach the limitations of claim 16. Referring to claim 17, Lewis teaches a source of the first power switch (2a) is in electrical communication with a drain of the second power switch (6a) and a drain of the third power switch (6b) is in communication with a source of the fourth power switch (2b).

Claim 18: Lewis and French et al teach the limitations of claim 17. Referring to claim 18, Lewis teaches a power source (V+), wherein a first side of the power source is in electrical communication with a drain of the first power switch (2a) and source of the third power switch (6b) and a second side of the power source is in electrical communication with a drain of the second power (6a) switch and a source of the fourth power switch (2b).

10. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tang et al in view of Jones et al

Claims 20: Tang et al teach the limitations of claim 19. Referring to claim 20, they do not teach a second capacitor in electrical parallel connection with the third and fourth power switch between a source of the third power switch and a drain of the fourth power switch. Jones et al teach a second capacitor (C1n) in electrical parallel connection with the negative side of the coil.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Tang et al to include a second capacitor as taught by Jones et al in order filter the power.

Claims 21: Tang et al and Jones et al teach the limitations of claim 20. Referring to claim 21, Tang et al teach the first capacitor (92) is mounted in close proximity to the first and second power switch (switches to the left of B). Jones et al teach the second capacitor (C1n) is mounted in close proximity to components on the negative side of the coil, wherein the first and second capacitors are configured to provide DC line filtering and snubbing of switch off transients (col. 3:16-31).

Response to Arguments

11. Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renata McCloud whose telephone number is (571) 272-2069. The examiner can normally be reached on Mon.- Fri. from 8 am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2800 ext. 4. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renata McCloud
Examiner
Art Unit 2837

RDM


MARLON T. FLETCHER
PRIMARY EXAMINER